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Economic Research Aid

AN APPRAISAL OF THE FIELD SURVEY OF SOVIET CIVIL AVIATION

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FOREWORD

The purpose of this research aid is to evaluate the positive intelligence gains in the field of civil air transportation and other intelligence benefits derived from an exchange of civil air delegations between the US and the USSR during 1960. The research aid also specifies several points of intelligence significance on which conflicting or apparently false information was obtained during the course of this exchange.

CONTENTS

Appendixes

AN APPRAISAL OF THE FIELD SURVEY OF SOVIET CIVIL AVIATION*

I. Introduction

An exchange of visits by groups of civil aviation officials was carried out between the US and the USSR in the summer and autumn of 1960 in accordance with arrangements made under the terms of Section III of the US-USSR Exchange Agreement dated 21 November 1959.

The Soviet delegation, comprising 10 officials of Aeroflot, the Soviet civil air carrier, was headed by Lt. General Georgiy S. Shchechikov, First Deputy of Aeroflot.** These Soviet officials visited the US from 1 August to 23 August under the sponsorship of the US Federal Aviation Agency (FAA). Visits were made to FAA facilities, airports, and maintenance and passenger facilities of several airline companies in Boston, New York, Washington, and Miami. The delegation also was briefed on the work of the FAA; the Civil Aeronautics Board; the Office of the Under Secretary of Commerce for Transportation; and the Port Authorities of New York, Boston, and Dade County, Florida. The Soviet delegation was entertained by officials of the Air Transport Association, American Aviation Publications, and the American Express Company and was given briefings on the functions of each organization. The professional aspects of the visit included mainly airline operations, air traffic control procedures and facilities, airfield layouts and installations, and terminals and passenger handling.

A 10-man US delegation, headed by Lt. General E.R. Quesada, Federal Aviation Agency Administrator, visited the USSR between 15 September and 5 October 1960.*** The tour in the USSR was sponsored by Aeroflot. The US delegation visited Aeroflot headquarters in Moscow, and the headquarters of four territorial administrations, as well as airfield facilities; terminals; traffic control centers; an overhaul base; and line maintenance facilities at Moscow (Vnukovo and Sheremet'yevo airfields), Kiev, and Tashkent. Briefings were received on the organizational, traffic management, engineering, operational, and inspection activities and assignments of Aeroflot; on the Directorate of Polar Aviation; and on the Moscow, Northern,

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* The estimates and conclusions in this research aid represent the best judgment of this Office as of 1 July 1961.

** For the names of the members of the Soviet delegation, see Appendix D.

*** For the names of the members of the US delegation, see Appendix C.

Ukrainian, and Uzbek Territorial Administrations. New types of high-performance aircraft were inspected.

Both tours were marked by cordiality and courtesy, and neither was marred by an unpleasant incident. The atmosphere was one of constantly improving mutual understanding.

On both sides of the Atlantic, efforts were made by US personnel to improve knowledge of Soviet civil aviation, including the filling of specific intelligence gaps. A number of questions on topics about which knowledge was uncertain were answered for the first time, and some general estimates and impressions were clarified or confirmed. The Soviet policy of maintaining secrecy over statistics on Aeroflot operations, data on aircraft performance, efficiency of maintenance, accidents, and other important aspects of air transportation, however, imposed difficulties in obtaining information that could be usefully compared with that of US airlines.

Members of the committee that escorted the Soviet delegation on its tour of the US contributed several short reports that are listed by subject matter in Appendix B.* A number of short reports on specific subjects also were written by members of the US delegation to the USSR, and these reports are listed in Appendix A.** In December 1960 the US delegation produced a comprehensive report of 103 pages plus appendixes, entitled Civil Air Transportation in the Union of Soviet Socialist Republics (USSR), which gives a general review and interpretation of the results of its findings.*** Each of the subjects alluded to in this evaluation is discussed in considerable detail in the general report. In addition, for the convenience of readers interested in examining the topical reports, reference will be made in the following sections to those reports that provide the most meaningful data on the subject being discussed.

The exchange produced for the US a few Soviet documents, including a Collective Labor Agreement, a description of the Air Code of the USSR, a general résumé of Aeroflot, a special article on Polar Aviation, one on the Aviation Engineering Service of Aeroflot, and short papers on the transportation service of Aeroflot and on the organization and control of civil air traffic. Although these documents contained nothing unusual in the way of new information, they served to clarify a number of procedural practices and techniques. A translated copy of each document is attached to the general report of the US delegation to the USSR, which was published by FAA.

* P. 21, below.
** P. 15, below.
*** See report 69, Appendix A.

Only one timetable of a territorial administration (Uzbek) was presented to the delegation in spite of the fact that the headquarters of three such administrations were visited. Numerous pictures were taken of aircraft, installations, and other objects. Of some 500 photographs that have been examined, about 250 were retained for their intelligence value.

In spite of the denial of certain specific information, a much clearer over-all picture of Soviet civil aviation resulted from the exchange, and the community now has more detailed and specific information about the organization, operation, personnel, and financial practices of Aeroflot. Considerable gains were made in knowledge of Soviet traffic control and navigational facilities. These gains alone make it more easy to rationalize and evaluate incoming intelligence information and to determine with more precision the extent of Soviet gains and potential in civil aviation. Current Soviet problems also can be understood better and their probable outcomes forecast more accurately.

During the course of the exchange, senior officials of Aeroflot gave out certain over-all figures that either do not accord with published index data or in other respects are inconsistent or subject to misinterpretation.

No sensitive geographic areas were visited by the US delegation. Access to certain types of installations, notably engine overhaul shops and radar installations, was denied.

In view of the fact that nearly everything shown to the Soviet delegation in the US either is publicized or can be seen readily by travelers or agents, whereas the practical workings of the Soviet system are often concealed or shaded, the US is believed to have made a net intelligence gain from the exchange.

A specific benefit of the exchange was the opportunity afforded the US delegation to impress on officials of Aeroflot the need for more technical information and greater assurances of safety of operation of certain Soviet high-performance aircraft in connection with the drafting of a bilateral treaty for air service connecting the US and the USSR.

In the following sections, the items that may be regarded as net gains to the US intelligence community resulting from the exchange are delineated and examined.

II. Findings

A. General Items

The delegation obtained the impression that Aeroflot is a "less favored" administration of the USSR and has not yet received the priorities in allocation of investment funds necessary to make it a first-rate and fully competitive airline. Except for aircraft, facilities have been of minimum quality and quantity. As yet Aeroflot has not been really pressed by high traffic volume but has satisfied a certain need for speedy transport by applying brute force to urgently pressing problems, with less attention to long-range planning.* Planning methods, or perhaps rather an approach to them, proceed from desirable future totals back to specific functions and quantities. No information on the matter of plans for increasing capacity and providing better facilities was forthcoming. Because of the large combination of activities in which Aeroflot engages, management and economic problems have been created which impair overall operating efficiency. The present system of traffic control, however, is adequate for the relatively low density of traffic.

The Soviet reluctance to join the International Civil Aviation Organization (ICAO) was discussed on several occasions. The delegation was able to establish that the main objection held by the USSR is that the provisions of the ICAO convention, particularly Article 5, constitute an infringement of Soviet rights and Soviet ability to control Soviet airspace.**

B. Organization of the Soviet Civil Air Fleet

The exchange produced an exceptionally clear picture of the organization of the Chief Directorate of the Civil Air Fleet (GUGVF), verifying what was already known about the general type of planning and operational set-up and resolving a number of uncertain points.*** The number of territorial administrations and groups, their functions, and the degree and type of control exercised over them by the GUGVF and the central government was brought out clearly. The delegation

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* See reports 32 and 59, Appendix A.

** See report 61, Appendix A. Article 5 states, in part, "Each contracting State agrees that all aircraft of the other contracting States, being aircraft not engaged in scheduled international air service shall have the right ... to make flights into or in transit non-stop across its territory and to make stops for non-traffic purposes without the necessity of obtaining prior permission, and subject to the right of the State flown over to require landing."

*** See reports 15, 18, 28, and 68, Appendix A.

also established the division of authority for the operation of international routes, domestic trunk routes, and local routes. Objectives and methods of planning flight schedules also were detailed.*

An organizational chart of the GUGVF obtained by a member of the delegation constituted new information in that it pinpointed and related precisely functions that previously had been known or assumed to exist in the headquarters.** The position of the airport in the administrative organization, quite different from that of airports in the US, is an example of the type of new data explained.

The methods and sources of financing Aeroflot and the allocation of financial responsibilities in the organization were identified clearly.*** Items paid for directly from the State budget and not charged to Aeroflot were enumerated. The US delegation also obtained considerable information on the methods by which rates and fares are established and cost calculations are performed. Soviet objectives in this field were clarified.†

Detailed information was provided by the Soviet authorities on the functions and accomplishments of the Moscow Territorial Administration†† and of the Directorate of Polar Aviation,††† which during the year became subordinate to Aeroflot.

C. Routes

The USSR provided figures on the total length of routes flown, exclusive of helicopter distances.‡ Although the length of local and feeder line routes was specified, figures of route distances included in international flights were not provided. Figures on the length of routes flown by each of the four territorial administrations visited by the delegation were given, however. The Soviet officials indicated that Aeroflot now has bilateral air agreements with 23 countries. Service is available on all of the routes concerned except the one to Oslo, Norway.

The number of regularly scheduled helicopter routes at the time of the visit of the US delegation to the USSR was given as 60.

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* See report 25, Appendix A.
** See report 14, Appendix A.
*** See report 12, Appendix B.
† See report 61, Appendix A.
†† See reports 24 and 61, Appendix A.
††† See reports 10, 11, 12, 13, 24, 26, 58, 59, and 61, Appendix A, and report 12, Appendix B.
‡ See report 57, Appendix A.

The Soviet officials pointed out the reasons why they plan to expand helicopter routes, even though by their own admission this service generally is uneconomic.

D. Operations and Statistics

1. Operations

Several features of the operations of Aeroflot that had not previously been known or appreciated by the US intelligence community were developed by the civil air exchange. Other operational matters were confirmed or clarified.

The US delegation obtained from the Soviet officials a description of procedures for loading and moving freight and mail and of methods adopted to ensure high load factors.* Aeroflot officials explained some of the special operating problems arising from the surplus equipment situation that exists in off-seasons in the northern areas and their inability to shift aircraft to other regions at such times.**

Information was obtained on the ultimate rate structure that Aeroflot hopes to achieve for its system and the impact that the new rate structure has had and is expected to have on competitive rail passenger transport. It was not made clear, however, whether the present winter differential would continue to take effect after the reduced rate schedules have been initiated.***

Soviet policy with respect to fuel reserves of high-performance aircraft was obtained, both for daytime and for night flying.† Methods of investigating and reporting officially on accidents were explained, including variations in procedure to accord with the nature and probable cause of the accident.†† No data on accidents themselves were furnished by the USSR.

2. Operating Statistics

Information existing on the organization that has responsibility for detailed planning and apportionment of passenger-kilometers and freight and mail ton-kilometers was confirmed. The methods of calculating flight hours and over-all ton-kilometer performance for

* See reports 19 and 68, Appendix A.
** See reports 12 and 18, Appendix B.
*** See report 61, Appendix A.
† See report 10, Appendix A.
†† See report 18, Appendix B.

each type of aircraft were explained, together with the channels and governmental echelons through which the plans must pass for final approval.* Subsequent planning methods for annual and quarterly operations of the territorial administrations were made clear, together with the facts that adequate statistics are kept and statistical analyses of work are performed as a basis for new planning and improvement of efficiency.

Very few nonpublished statistics relating to over-all operations were gathered in the course of the exchange.** On the other hand, certain facts and figures on the operations of territorial administrations and individual airports were supplied, which generally are consistent with estimates made by this Office of total operations.

The proportion of Aeroflot's operations that take place at night, both for the USSR as a whole and for the Ukraine alone, was made available.*** Variations of such operations between summer and winter were given for the Ukraine. Average passenger load factors of Aeroflot for winter and summer were contrasted.

Several statements in the reporting on volumes of traffic that resulted from the exchange appear to be erroneous. The planned figures for passengers carried in 1960 (25 million) on page 31 of the official report of the US delegation, giving Mr. Porsegov, Chief Economist of Aeroflot, as a source, are substantially out of line with the estimate of 11.8 million passengers carried, which was derived from Soviet indexes applied to fairly firm basic data. Moreover, on page 33, the figures on passengers carried are compared erroneously with US data, because each passenger is counted only once per trip on Aeroflot, but in US statistics a passenger making an interline trip is counted each time he boards the plane of a new carrier involved in the journey.

In another report, arrivals and departures of passengers at Moscow for 1960 were quoted by General Shchechikov to be more than

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* See report 68, Appendix A.

** Two statements pointing to the passenger-kilometer performance of Aeroflot in 1958 were given to the US delegation and at the same time made public. First, in 1958 the number of passenger-kilometers per inhabitant was 32. (See report 16, Appendix A.) In mid-1958 the population was 207 million. The product of these figures is 6.6 billion. Second, Aeroflot's share of all passenger traffic in 1958 was stated by a high official of Aeroflot to be 3.1 percent, which represents about 6.5 billion passenger-kilometers. (See report 17, Appendix A.)

*** See reports 30 and 69 (p. 101), Appendix A.

8 million per year,* a figure that from other indications and observations seems unbelievably high. On the Moscow-Leningrad route there are 14 scheduled flights of Tu-104B's each way per day, providing for 1,400 passengers, rather than 14,000 passengers as mistakenly stated in a subsidiary report.** The Seven Year Plan (1959-65) calls for an increase of 600 percent above that for 1958, or a sevenfold expansion, which is the same in Soviet terminology. In one report the plan has been mistakenly quoted as calling for a 700-percent increase in passengers carried.***

The average length of haul of passengers given by Porsegov is almost one-third less than the estimate made by this Office, but Porsegov's figure could refer to the average length of movement on each flight rather than the length of movement on through tickets, to which the estimate of this Office pertains.

3. Cost Data

Average cost figures per passenger-kilometer and per ton-kilometer were given for the entire USSR.† For the Uzbek Territorial Administration, figures were given for average cost of freight transport and for freight transport on jet and turboprop aircraft alone for the first 8 months of 1960.†† For the Ukrainian Territorial Administration, only average passenger fares were given.††† It is hard to delineate specific intelligence gains in the field of cost data except that substantiation has been provided for the general range of magnitude of present estimates by this Office.

E. Efficiency

The US delegation acquired new information on various measures of efficiency of operations such as utilization, earning power, overhaul, depreciation of aircraft, systems of crew assignment, and size of the labor force.

The practice of relieving Aeroflot operations of overhead cost by such means as carrying all expenses of GUGVF, including the development of new aircraft, on the budget of the central government of the

* See report 16, Appendix B.
** See report 32, Appendix A.
*** See report 4, Appendix B.
† See report 61, Appendix A.
†† See report 48, Appendix A.
††† See report 30, Appendix A.

USSR was made clear.* The delegation also obtained new data on the manner of purchase and method of payment for new aircraft by Aeroflot.**

The financial independence and responsibilities of the territorial administrations were described, together with the general extent to which the State furnishes, interest free, major capital facilities and basic working capital. The source of funds for maintenance and limited improvement of airports also was outlined.**

High average figures for load factor were announced by officials of Aeroflot (85.3 percent domestic for the Moscow Territorial Administration), with the implication that Aeroflot is trying to raise them even higher. An average load factor of 73 percent for international flights announced by the Moscow Territorial Administration seems too high to be realistic in the light of reported observations. It is possible that the aircraft were carrying, at least out of the USSR, supplemental loads of mail or freight which were put aboard when a full passenger list was wanting.***

Figures were supplied by Aeroflot for average utilization of Tu-104's, Il-18's, and An-10's, but these figures could not possibly have applied to total inventories of aircraft. It is assumed that the figures must be based on the 24-hour day only for aircraft which actually flew or aircraft which were in generally continuous service.†

The organizational set-up for overhaul and maintenance was furnished by Aeroflot. Figures on times between regular overhauls and maintenance checks on several types of aircraft and engines also were supplied. Figures also were given on the number of man-hours required to perform overhauls and the total time required, but, after viewing the overhaul facility of Vnukovo for the Tu-104, the US delegation had some doubt as to the validity of the figures.††

F. Description and Inventory of Transport Aircraft

The US delegation to the USSR ascertained that the responsibility for planning, developing, and putting into operation of new aircraft rests with the Chief Engineer of Aeroflot and obtained considerable data on his organization and its subunits.††† In addition,

* See report 58, Appendix A, and report 12, Appendix B.
** See report 58, Appendix A.
*** See report 61, Appendix A.
† See reports 30, 58, and 64, Appendix A.
†† See reports 9, 16, 30, 58, and 59, Appendix A, and reports 6, 12, and 18, Appendix B.
††† See report 1, Appendix A.

the delegation was able to establish precisely the division of responsibility between Aeroflot and the design bureaus (OKB's) in the matter of research and development of new types of aircraft and the amount of control and coordination stemming from Aeroflot.*

Initial purchase costs to Aeroflot were obtained on the following high-performance aircraft: the An-10, the Il-18, and the Tu-104 and its variants.** (The purchase costs were much less than the estimates of production costs worked out by this Office.) Further details on the capabilities of the An-10 and intentions regarding its use, particularly on short hauls, were obtained, and the opinion of observers that the aircraft was being test flown with mail and cargo until it should prove itself was confirmed.***

The US delegation was told the nature of the difficulties with the Il-18 transport (a nonhermetic insulation on the fuel injection nozzle, which caused fuel leakage and burned out combustion chambers†). The delegation was able to report considerable information on the extensive retrofit program being carried out on the Il-18 at the time of the visit.

Information on the Tu-104 was received from the Soviet crew, the Soviet representatives accompanying the US delegation, and firsthand observation. Details were obtained that, taken together with previously available data, confirmed the impression that the Tu-104 is uneconomical and difficult to operate, but that Aeroflot does a fairly good job with it.††

A Soviet statement that Leningrad had Tu-114 aircraft on scheduled service in August 1960 was undoubtedly false.†††

The US delegation was impressed with the extent to which Aeroflot uses and plans to increase the use of helicopters in transport service in comparison with other countries because of its need to reach spots where there are no airports and to penetrate rapidly to actual sites of state activities. The US delegation reported on what seemed to be a series of holdups on the progress of the Mi-6, the prototype of which was reported to have established a number of

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* See report 12, Appendix A.
** See report 59, Appendix A, and report 12, Appendix B.
*** See report 30, Appendix A.
† See reports 23 and 59, Appendix A.
†† See reports 10, 22, 43, 59, and 61, Appendix A, and report 5, Appendix B.
††† See report 12, Appendix B.

records in October 1957, and of the Yak-24, which seems to have poor synchronization of rotors while in flight.*

Little information was obtained on Soviet intentions to produce a supersonic transport except that such an aircraft may be in operation by 1967-70, with a Mach number between 2 and 3.**

No inventory figures were supplied on the total number of transport aircraft or helicopters owned by Aeroflot, although some figures on individual types were obtained for territorial administrations. As a result of the number of civil air transports observed standing idle, the impression was confirmed that Aeroflot had an inventory of aircraft, particularly high-performance transports, far in excess of that required to meet its currently scheduled operations.

Shchechikov, while in the US, reportedly stated to a US government official that 72 percent of Soviet commercial aircraft are turboprops and jets.*** This, according to present estimates and observations, appears to have been false, both regarding total aircraft and seating capacity. It might possibly have applied to seats currently used on a daily basis, but even this is doubtful.

G. Airports and Airport Operations

The US delegation provided new intelligence on the organizational responsibilities of Aeroflot for the development of airport standards and operational requirements and the degree to which the territorial administrations participate in the construction of facilities.† The dimensions for standard runways to be used on new main line airports also were provided.††

Detailed information was supplied on the five main airports visited by the US delegation (Vnukovo, Sheremet'yevo, Leningrad, Kiev/Borispol', and Tashkent). Costs, specifications, and capacity data were obtained for a new airport to be built at Kiev.††† The professional evaluation of the standard Soviet system of airport planning made by the US delegation provided much valuable information.

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* See reports 7, 48, and 58, Appendix A, and report 6, Appendix B.
** See report 12, Appendix B.
*** See report 15, Appendix B.
† See report 28, Appendix A.
†† See reports 44 and 47, Appendix A.
††† See reports 30, 31, 34, 35, and 37, Appendix A.

The US delegation brought home an organizational chart of a typical main route airport that shows how the airport carried out its administrative and executive functions.

Observations and detailed descriptions were made by the US delegation of the very long approach lighting system (the Calvert system) in use at new Soviet airports.* The delegation also reported on numerous specialized facilities, still in the planning stage, that the USSR will use to expedite the accommodation of through passengers at main airports.

Reporting on the Soviet delegation provided information about several problems in which the delegation showed a high degree of interest, particularly airport lighting and communications systems, procedures, maintenance, and passenger handling.**

H. Traffic Control

The organizational unit in the GUGVF responsible for the control of air traffic was identified, and its planning and directional functions were distinguished clearly from the operational functions of each territorial administration.*** The establishment of regional control of airspace by Aeroflot and the division of airspace into upper regions controlling jet traffic and lower regions controlling piston traffic and helicopters also was described.† The degree and type of control exercised over its own airspace by each territorial administration was clarified as were: (1) the function of a dispatching center to direct flights and control the movement of all aircraft within its region and (2) the degree of local control exercised by airports.††

The unusual degree of responsibility of the air traffic controller for the safety of the aircraft under instrument flight rules and the extent of his authority were clarified. The division of responsibilities between air traffic controllers and ground traffic control was described in full.†††

With respect to airports, information was gained on all forms of ground control as well as on patterns of plane arrival. Average operations figures were given for Vnukovo, Leningrad, and Tashkent,

* See reports 7 and 18, Appendix B.
** See reports 68, Appendix A, and report 18, Appendix B.
*** See reports 51, 52, and 67, Appendix A.
† See report 3, Appendix A.
†† See report 4, Appendix B.
††† See reports 36 and 50, Appendix A, and report 18, Appendix B.

but they are believed to include many training and special flights of small aircraft.* No over-all traffic figures were supplied.

A report which seems erroneous in the light of existing schedules states that Soviet controllers on the heaviest traveled routes handle 40 aircraft per hour and that the average on all routes is 15 aircraft per hour.** It might be that these density figures include military aircraft, but they seem unduly high in any event.

I. Navigation Aids

Concrete information was obtained on the designation of trunk air routes and local routes and on the marking system for internal airways, with points of similarity and dissimilarity to that of the US brought out. The delegation confirmed the utilization of ground-based radar for surveillance on basic airways and provided data on the installation of long-range radars at several main airports.***

Previous information on visual navigation aids at Soviet airports was supplemented and assessed in a more definitive manner. Fairly extensive reporting, which provided new intelligence on the navigation and communications facilities at Vnukovo Airport, was made by the delegation.†

The delegation was able to report new information on the staffing and disposition of meteorological stations and the frequency with which weather forecasts and reports are prepared.††

J. Operating and Training Standards

1. Operating Standards

The US delegation was able to obtain the approximate pay rates and scales of air crew members, along with information on additional fringe benefits and retirement provisions.††† Pay scales for mechanics and other ground personnel, including chiefs of territorial administrations, were also obtained. Retirement conditions based on age and years of service were obtained from the Soviet delegation visiting the US.‡

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* See report 69, Appendix A.
** See report 36, Appendix A.
*** See reports 24 and 45, Appendix A, and reports 9 and 18, Appendix B.
† See report 43, Appendix A.
†† See report 7, Appendix B.
††† See reports 24 and 58, Appendix A, and report 2, Appendix B.
‡ See report 29, Appendix A, and report 18, Appendix B.

The status of the trade union in representing all Aeroflot employees was described clearly, as well as the method of periodic negotiation of agreements. The responsibilities for discipline, training, and indoctrination of the trade union were outlined, as well as its task of propagandization.*

2. Training Standards

The delegation was able to produce a considerable amount of new intelligence on procedures for hiring and apprentice training of new personnel. Details were obtained on methods of selection of pilots and other crew candidates for both turbine and jet aircraft and on physical requirements for these posts.** The Leningrad School for pilots was visited and described in detail, along with essential elements of flight crew training.*** A report on the training by Aeroflot of air traffic control personnel provided considerable insight into this phase of Soviet civil aviation.†

* See report 61, Appendix A, and report 18, Appendix B.
** See reports 12 and 18, Appendix B.
*** See report 29, Appendix A.
† See report 56, Appendix A.